tyco
Healthcare

United States Surgical

United States Surgical
195 Mc Dermott Road
North Haven, CT 06473

Tele: 203 492 5000
www.ussurg.com

August 9, 2012

Central Permit Processing Unit
Department of Energy and Environmental Protection
79 Elm Street
Hartford, CT 06106-5127

Re: Minor Modification Application for an Existing New Source Review Permit
United States Surgical, Division of Tyco Healthcare Group LP
Permit Numbers 135-0143, 135-0144, 135-0145 and 135-0146

Dear Sir/Madam:

Enclosed please find a *Minor Modification Application for an Existing New Source Review Permit* for the United States Surgical, Division of Tyco Healthcare Group LP facility located at 195 McDermott Road in North Haven. Also enclosed is Check# 1504426 in the amount of $7,000 for the permit minor modification fees for the four (4) permits listed above.

If you have any questions or require any additional information please contact me at (203) 492-6254 or by email at steven.burke@covidien.com.

Sincerely,

Steven Burke
Principal Environmental, Health and Safety Engineer

Enclosures

Steven

n: trackingupdates@fedex.com
ent: Friday, August 10, 2012 9:21 AM
To: Burke, Steven
Subject: FedEx Shipment 495722847027 Delivered

This tracking update has been requested by:

Company Name:	COVIDIEN
Name:	OFFICE SERVICES
E-mail:	'not provided by requestor'

Our records indicate that the following shipment has been delivered:

Purchase order number:	STEVEN.BURKE
Reference:	310255
Ship (P/U) date:	Aug 9, 2012
Delivery date:	Aug 10, 2012 9:18 AM
Sign for by:	E.STANTON
Delivery location:	HARTFORD, CT
Delivered to:	Mailroom
Service type:	FedEx Standard Overnight
Packaging type:	FedEx Envelope
Number of pieces:	1
Weight:	0.50 lb.
Special handling/Services:	Deliver Weekday
Tracking number:	495722847027

Shipper Information	Recipient Information
OFFICE SERVICES	CENTRAL PERMIT PROCESSING UNIT
COVIDIEN	CT DEPT. OF ENERGY & ENVIRON. PROT.
60 MIDDLE TOWN AVE.	79 ELM STREET
NORTH HAVEN	HARTFORD
CT	CT
US	US
06473	06106

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Thank you for your business.

SUPPLIER NAME	SUPPLIER NUMBER	CHECK NUMBER
CONNECTICUT DEPARTMENT OF	90142168	1504426

DATE	INVOICE NO	DOC TYPE	DOCUMENT	GROSS	CREDIT AMOUNT	DISCOUNT
07162012	716121 Permit# 135-0143, 135-0144, 13	PV	3260626	7,000.00		

COVIDIEN
510 Parkland Drive
Sandy, UT 84070

BANK OF NEW YORK - MELLON
PITTSBURGH, PA 15259

60-160
433

1504426

Date July 20, 2012

PAY EXACTLY: Seven Thousand and 00/100 Dollars

VOID AFTER 120 DAYS

000013 1/1

TO THE ORDER OF

CONNECTICUT DEPARTMENT OF
79 ELM STREET
ENVIORMENTAL PROTECTION
BUREAU OF ADMINISTRATION
HARTFORD, CT 06106-5127

*****$7,000.00

CJ Dockendorff

AUTHORIZED SIGNATURE

⑈01504426⑈ ⑆043301601⑆ 040⑈6035⑈

Connecticut Department of
Energy & Environmental Protection
Bureau of Air Management
Engineering & Enforcement Division

Minor Modification Application for an Existing New Source Review Permit

Complete this form in accordance with CGS section 22a-174, RCSA sections 22a-174-1, 2a and 3a and the instructions (DEP-AIR-INST-200) to ensure the proper handling of your application. Print or type unless otherwise noted. You must submit the fee along with this form.

CPPU USE ONLY
App #:
Doc #:
Check #:
Program/EI/App Type: Air Engineering/NSR/Minor Modification

Part I: Fee Information

The application fee of $940.00 must be submitted for *each* minor permit modification and is applied towards the full permit minor modification fee. However, the time period of the permit process can be shortened by submitting the full permit minor modification fee. For major emitting equipment, the fee is $3,250.00 for *each* minor permit modification. For less than major emitting equipment, the fee is $1,750.00 for *each* minor permit modification. The fee for municipalities is 50% of the above listed rate. The application will not be processed until DEEP receives the application fee. The fee shall be non-refundable and shall be paid by check or money order to the Department of Energy & Environmental Protection.

Check one:

- ☐ Application fee = $940
- ☒ Permit Minor Modification fee (**< major emitting equipment**) = $1,750 x 4 = $7,000
- ☐ Permit Minor Modification fee (**major emitting equipment**) = $3,250

Please provide existing permit number: Permits 135-0143, 135-0144, 135-0145 & 135-0146

Part II: Applicant Information

- *If an applicant is a corporation, limited liability company, limited partnership, limited liability partnership, or a statutory trust, it must be registered with the Secretary of State. The applicant's name shall be stated* ***exactly*** *as it is registered with the Secretary of* State. *This information can be accessed at CONCORD.*
- *If an applicant is an individual, provide the legal name (include suffix) in the following format: First Name; Middle Initial; Last Name; Suffix (Jr, Sr., II, III, etc.).*

1. **Applicant: United States Surgical, Division of Tyco Healthcare Group LP**

   Mailing Address: **195 McDermott Road**

   City/Town: **North Haven** State: **CT** Zip Code: **06473**

   Business Phone: **203 492-6254** ext.: Fax: **203 492-6289**

   Contact Person: **Steven Burke** Title: **Principal EHS Engineer**

   *E-mail: **steven.burke@covidien.com**

   *By providing this e-mail address you are agreeing to receive official correspondence from the department, at this electronic address, concerning the subject application. Please remember to check your security settings to be sure you can receive e-mails from "ct.gov" addresses. Also, please notify the department if your e-mail address changes.

Part II: Applicant Information (continued)

a) Applicant Type (check one): ☐ individual ☒ *business entity ☐ federal agency
☐ state agency ☐ municipality ☐ tribal

*If a business entity:

i) check type: ☐ corporation ☐ limited liability company ☒ limited partnership
☐ limited liability partnership ☐ statutory trust ☐ Other: _____

ii) provide Secretary of the State business ID #: **0264413** This information can be accessed at CONCORD

iii) ☐ Check here if you are **NOT** registered with the Secretary of State's office.

b) Applicant is ☐ Owner ☒ Operator (check all that apply) of this equipment.

☐ Check if any co-applicants. If so, attach additional sheet(s) with the required information as requested above.

2. Primary contact for departmental correspondence and inquiries, if different than the applicant.

Name: **same as applicant**

Mailing Address:

City/Town: State: Zip Code:

Business Phone: ext.: Fax:

Contact Person: **same as applicant** Title:

*E-mail:

*By providing this e-mail address you are agreeing to receive official correspondence from the department, at this electronic address, concerning the subject application. Please remember to check your security settings to be sure you can receive e-mails from "ct.gov" addresses. Also, please notify the department if your e-mail address changes.

3. Equipment Owner or Operator, if different than the applicant:

Name: **United States Surgical Corporation**

Mailing Address: **555 Long Wharf Drive**

City/Town: **New Haven** State: **CT** Zip Code: **06511**

Business Phone: **203 492-8219** ext.: Fax: **203 492-8226**

Contact Person: **David Senft** Title: **Senior Director EHS**

Email: **david.senft@covidien.com**

4. Preparer of this application.

Name: **SCI-TECH, Inc.**

Mailing Address: **185 Silas Deane Highway**

City/Town: **Wethersfield** State: **CT** Zip Code: **06109**

Business Phone: **860 218-6393** ext.: Fax: **860 257-0767**

Contact Person: **Raymond F. Yarmac, P.E.** Title: **Principal Consulting Engineer**

Email: **ryarmac@sci-techinc.com**

Service Provided: **application preparation**

☐ Check here if additional sheets are necessary, and label and attach them to this sheet.

Part III: Permit Modification Information

- *Attach a marked up copy of the original NSR permit(s) noting proposed changes.*

1. **Facility Name and Location:**

   Name of Facility : **United States Surgical, Division of Tyco Healthcare Group LP**

   Street Address: **195 McDermott Road**

   City/Town: **North Haven** State: **CT** Zip Code: **06473**

2. **Permit No(s): 135-0143, 135-0144, 135-0145 & 135-0146**

3. **Description of Modification:** (Example: Increase fuel usage.)

   Change in stack characteristics, the addition of a separate stack for secondary aeration rooms, and a minor increase in emissions

Part IV: Applicant Certification

The applicant *and* the individual(s) responsible for actually preparing the application must sign this part. An application will be considered incomplete unless all required signatures are provided. [If the applicant is the preparer, please mark N/A in the spaces provided for the preparer.]

"I have personally examined and am familiar with the information submitted in this document and all attachments thereto, and I certify that based on reasonable investigation, including my inquiry of the individuals responsible for obtaining the information, the submitted information is true, accurate and complete to the best of my knowledge and belief.

I understand that a false statement in the submitted information may be punishable as a criminal offense, in accordance with section 22a-6 of the General Statutes, pursuant to section 53a-157b of the General Statutes, and in accordance with any other applicable statute.

I certify that this application is on complete and accurate forms as prescribed by the commissioner without alteration of the text."

Signature of Applicant	8/9/2012 Date
Steven Burke Name of Applicant (print or type)	**Principal EHS Engineer** Title (if applicable)
Signature of Preparer (if different than above)	**8/6/2012** Date
Raymond F. Yarmac, P.E. Name of Preparer (print or type)	**Principal Consulting Engineer** Title (if applicable)

☐ Check here if additional signatures are required. If so, please reproduce this sheet and attach signed copies to this sheet. You must include signatures of any person preparing any report or parts thereof required in this application (i.e., professional engineers, consultants, etc.)

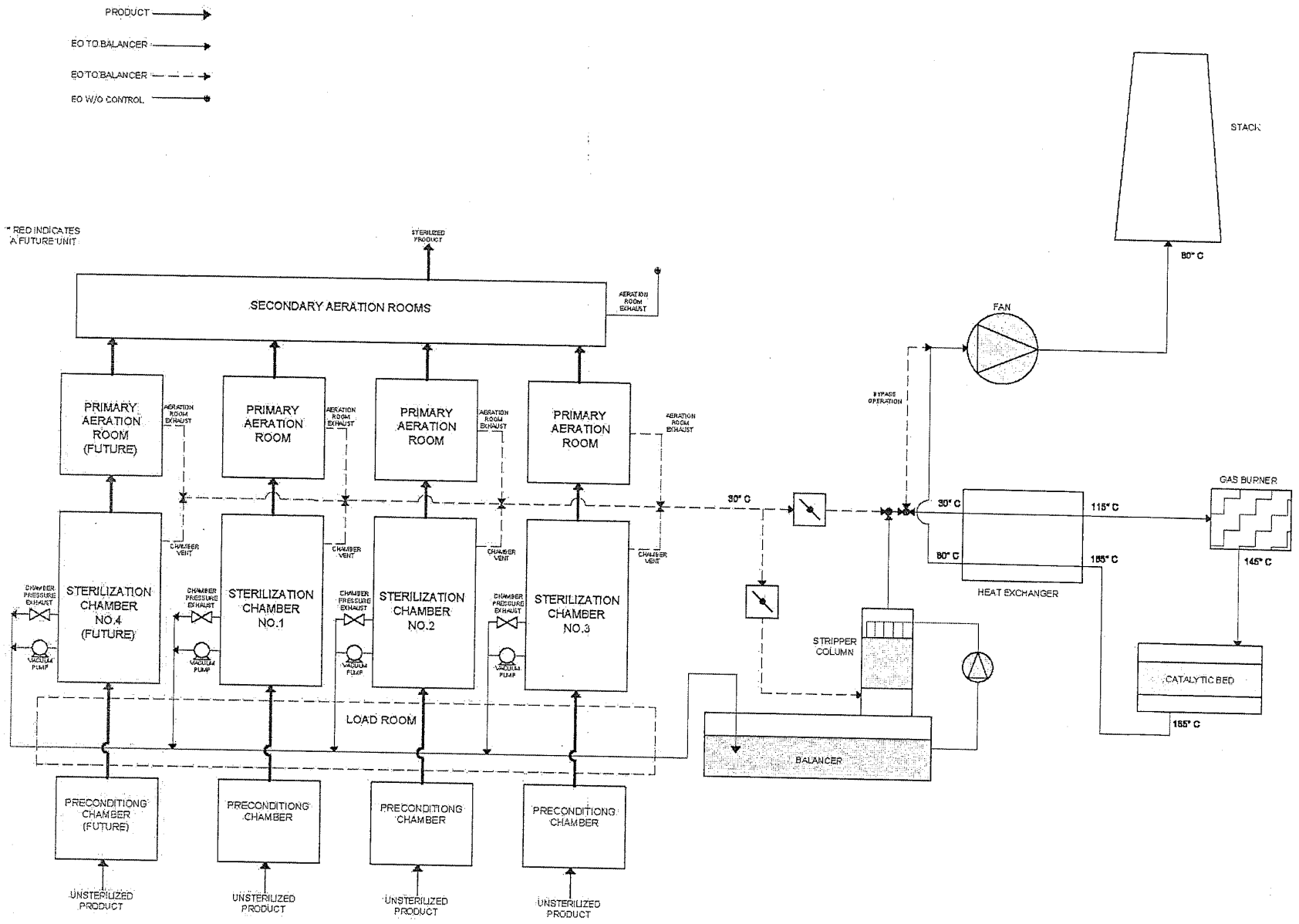
Note: Please submit the completed Application Form, Fee, and all Supporting Documents to:

CENTRAL PERMIT PROCESSING UNIT
DEPARTMENT OF ENERGY & ENVIRONMENTAL PROTECTION
79 ELM STREET
HARTFORD, CT 06106-5127

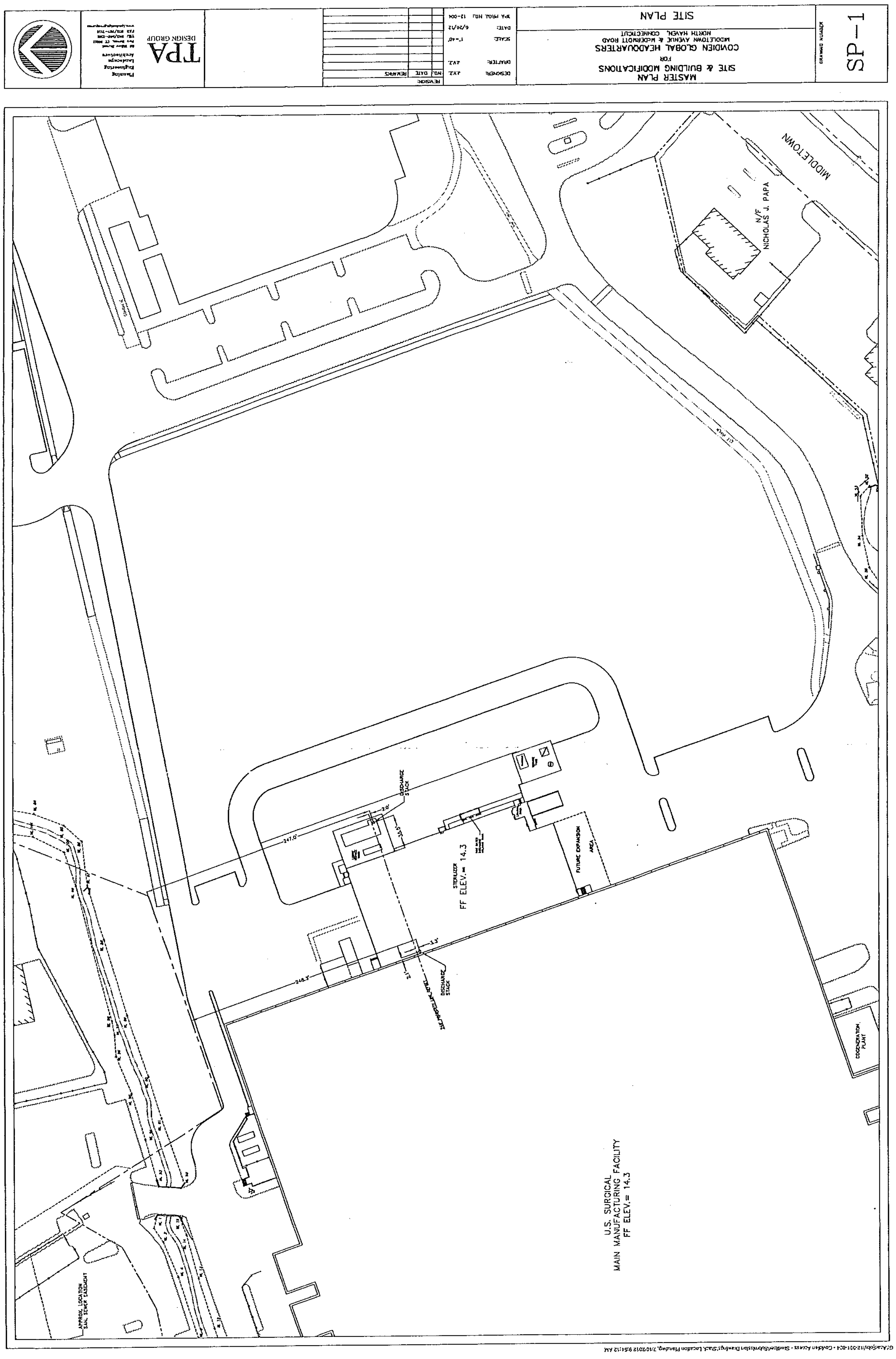
PROJECT DESCRIPTION

United States Surgical, Division of Tyco Healthcare Group LP hereby submits an application for minor modifications to the New Source Review Permits issued on 11/8/2011 for the installation and operation of four new sterilization systems with a common air pollution control device. The modifications include a change in the sterilizer stack characteristics, the addition of a separate stack for the secondary aeration rooms, and a minor increase in emissions. The modification application package contains the following information.

- Minor Modification Application Form, DEP-APP-200MM
- Process Schematic
- Site Plan
- Estimated Ethylene Oxide Emissions
- CTDEEP HAP Compliance Demonstration
- Attachment E-2, Air Pollution Control Equipment Form, DEP-APP-210
- Attachment E-3, Stack Parameters Form, DEP-AIR-APP-211
- Attachment G, BACT Determination Form, DEP AIR-APP-214
- Marked up copy of Permit No. 135-0143 indicating the requested modifications. The permit is attached as an example. Permits 135-0144, 135-0145 and 135-0146 should be revised in a similar manner.



PROCESS SCHEMATIC


MASTER PLAN
FOR
SITE & BUILDING MODIFICATIONS
COVIDIEN GLOBAL HEADQUARTERS
MIDDLETOWN AVENUE & McDERMOTT ROAD
NORTH HAVEN, CONNECTICUT
SITE PLAN
SP-1
TPA
DESIGN GROUP
MIDDLETOWN
N/F
NICHOLAS J. PAPA
DISCHARGE STACK
STERILIZER
FF ELEV.= 14.3
FUTURE EXPANSION AREA
COGENERATION PLANT
U.S. SURGICAL
MAIN MANUFACTURING FACILITY
FF ELEV.= 14.3
APPROX. LOCATION
SANI. SEWER EASEMENT

Revised ETO Emissions

Equipment ID	Equipment Description	Potential ETO Usage			Potential ETO Emissions		ETO Control	Proposed ETO Emissions				
								@99.9% Control	@1 PPM Exhaust	Worst Case		
		lb/batch	batch/day	days/yr	lb/yr	lb/hr	% or PPM	lb/yr	lb/yr	lb/yr	lb/hr	% Control
ST-7	Sterilization Chamber	50	4	365	73,000	8.33	99.9 % or 1 PPM	73.0	128.5	128.5	0.0147	99.8
PAR7	Primary Aeration Room	variable	variable	variable	included above	included above	included above	included above	included above	included above	included above	included above
ST-8	Sterilization Chamber	50	4	365	73,000	8.33	99.9 % or 1 PPM	73.0	128.5	128.5	0.0147	99.8
PAR8	Primary Aeration Room	variable	variable	variable	included above	included above	included above	included above	included above	included above	included above	included above
ST-9	Sterilization Chamber	50	4	365	73,000	8.33	99.9 % or 1 PPM	73.0	128.5	128.5	0.0147	99.8
PAR9	Primary Aeration Room	variable	variable	variable	included above	included above	included above	included above	included above	included above	included above	included above
ST-10	Sterilization Chamber	50	4	365	73,000	8.33	99.9 % or 1 PPM	73.0	128.5	128.5	0.0147	99.8
PAR10	Primary Aeration Room	variable	variable	variable	included above	included above	included above	included above	included above	included above	included above	included above
Total	Sterilization Chambers & Primary Aeration				292,000	33.33	99.9 % or 1 PPM	292	514	513.9	0.0587	99.8
PolSAR	Polymer Secondary Aeration Room	variable	variable	variable	included below	included below	NA	NA	included below	included below	included below	included below
SutSAR	Suture Secondary Aeration Room	variable	variable	variable	included below	included below	NA	NA	included below	included below	included below	included below
Total	Secondary Aeration Rooms				749	0.08548			749	748.8	0.0855	0.0
Total	Sterilization System				292,000	33			1263	1263	0.1441	99.6
Total Sterilizer System					146.0	ton/yr				0.631	ton/yr	

Maximum total sterlizer system exhaust flow	7,100 scfm	8,552 acfm at 80 C / 176 F
Minimum total sterlizer system exhaust flow		
Maximum secondary aeration system exhaust flow	11,750 scfm	12,462 acfm at 100 F
Minimum secondary aeration system exhaust flow		

CT DEP Maximum Allowable Stack Concentration (MASC) Calculator

Company Name:	United States Surgical, Division of Tyco Healthcare Group LP
Source Description:	ETC Catalytic Oxidizer Sterilizer System Exhaust Stack

Instructions

Stack Parameter Units:	English	
Stack Height =	58	ft
Minimum Distance from Stack to Property Line =	247	ft
Exhaust Stack Flow Rate =	8,552	acfm
Hazard Limiting Values (HLV) Averaging Times =	8-Hour	
Adjustments to the MASC for Time Periods < 8 hrs =	No	

Notes:

Additional HAPs | Clear All | Print | Footnotes

Hazardous Air Pollutant(s)	CAS No.	HLV ($\mu g/m^3$)	Proposed Allowable Emission Rate (lb/hr)	MASC ($\mu g/m^3$)	ASC ($\mu g/m^3$)	Complies?
Ethylene oxide	75-21-8	20	5.87E-02	3.92E+03	1.83E+03	yes
Benzene	71-43-2	150	2.79E-06	2.94E+04	8.71E-02	yes
p-Dichlorobenzene	106-46-7	9000	1.59E-06	1.76E+06	4.96E-02	yes
Formaldehyde	50-00-0	12	9.96E-05	2.35E+03	3.11E+00	yes
Hexan (n-hexane)	110-54-3	3600	2.39E-03	7.05E+05	7.46E+01	yes
Naphthalene	91-20-3	1000	8.10E-07	1.96E+05	2.53E-02	yes
Polynuclear aromatic hydrocarbons (PAH) *	50-32-8	0.1	1.51E-08	1.96E+01	4.71E-04	yes
Toluene	108-88-3	7500	4.51E-06	1.47E+06	1.41E-01	yes
Arsenic & compounds (as As)	7440-38-2	0.05	2.66E-07	9.79E+00	8.30E-03	yes
Barium (soluble compound) as Ba	7440-39-3	10	5.84E-06	1.96E+03	1.82E-01	yes
Beryllium	7440-41-7	0.01	1.59E-08	1.96E+00	4.96E-04	yes
Cadmium	7440-43-9	0.4	1.46E-06	7.83E+01	4.56E-02	yes
Chromium, metal	7440-47-3	2.5	1.86E-06	4.90E+02	5.80E-02	yes
Cobalt metal, dust & fume (as Co)	7440-48-4	2	1.12E-07	3.92E+02	3.50E-03	yes
Copper-dust & mists (as Cu)	7440-50-8	20	1.13E-06	3.92E+03		yes
Manganese fume (as Mn)	7439-96-5	20	5.04E-07	3.92E+03	1.57E-02	yes
Mercury vapor	--	1	3.45E-07	1.96E+02	1.08E-02	yes
Molybdenum (insoluble compounds)	--	200	1.46E-06	3.92E+04	4.56E-02	yes
Nickel (metal)	7440-02-0	5	2.79E-06	9.79E+02	8.71E-02	yes
Vanadium, as Pentoxide, -Fume	1314-62-1	1	3.05E-06	1.96E+02	9.52E-02	yes
Copper-dust & mists (as Cu)	7440-50-8	20	1.13E-06	3.92E+03	3.53E-02	yes

CT DEP Maximum Allowable Stack Concentration (MASC) Calculator

Company Name:	United States Surgical, Division of Tyco Healthcare Group LP
Source Description:	Secondary Aeration Room Exhaust

Instructions

Stack Parameter Units:	English	
Stack Height =	58	ft
Minimum Distance from Stack to Property Line =	248	ft
Exhaust Stack Flow Rate =	12,462	acfm
Hazard Limiting Values (HLV) Averaging Times =	8-Hour	
Adjustments to the MASC for Time Periods ≤ 8 hrs =	No	

Notes:

Additional HAPs | Clear All | Print | Footnotes

Hazardous Air Pollutant(s)	CAS No.	HLV ($\mu g/m^3$)	Proposed Allowable Emission Rate (lb/hr)	MASC ($\mu g/m^3$)	ASC ($\mu g/m^3$)	Complies?
Ethylene oxide	75-21-8	20	8.55E-02	2.74E+03	1.83E+03	yes

Attachment E-2 Supplemental Application Form
Air Pollution Control Equipment

DEP USE ONLY
App. No.:
EPE No.:

Applicant Name: **United States Surgical, Division of Tyco Healthcare Group LP**
(As indicated on *Permit Application Transmittal Form)*

Section I. Summary Sheet (Make additional copies, if necessary)

Unit Number (1)	Unit Description (2)	Control Equipment		Overall Control Efficiency % (5)	Pollutants Controlled (6)	*Basis (7)	Stack No. (8)
		No. (3)	Type (4)				
ST-7	ETC Sterilizer 1	E-401	Catalytic Oxidizer	99.9% or 1 PPM	Ethylene Oxide	Mfg Guarantee	E-401
PAR7	ST-7 Primary Aeration Room	E-401	Catalytic Oxidizer	99.9% or 1 PPM	Ethylene Oxide	Mfg Guarantee	E-401
ST-8	ETC Sterilizer 2	E-401	Catalytic Oxidizer	99.9% or 1 PPM	Ethylene Oxide	Mfg Guarantee	E-401
PAR8	ST-8 Primary Aeration Room	E-401	Catalytic Oxidizer	99.9% or 1 PPM	Ethylene Oxide	Mfg Guarantee	E-401
ST-9	ETC Sterilizer 3	E-401	Catalytic Oxidizer	99.9% or 1 PPM	Ethylene Oxide	Mfg Guarantee	E-401
PAR9	ST-9 Primary Aeration Room	E-401	Catalytic Oxidizer	99.9% or 1 PPM	Ethylene Oxide	Mfg Guarantee	E-401
ST-10	ETC Sterilizer 4	E-401	Catalytic Oxidizer	99.9% or 1 PPM	Ethylene Oxide	Mfg Guarantee	E-401
PAR10	ST-10 Primary Aeration Room	E-401	Catalytic Oxidizer	99.9% or 1 PPM	Ethylene Oxide	Mfg Guarantee	E-401

Note: The catalytic oxidizer is equipped with a balancer to equalize the incoming variation in ethylene oxide concentration.

** Attach supporting documentation with this form, e.g., stack test data, manufacturer's guarantee, etc.*

Section II: Specific Control Equipment

(Complete the appropriate subsection for each *distinct* piece of control equipment you utilize. You may reproduce the pages of the form as necessary.)

Adsorption Device

1a. Designated Reference Number of Adsorption Unit:

1b. Designated Reference Number of Unit which uses Adsorber:

2. Manufacturer:

3. Model Name & Number:

4. Construction Date: / /

5. Adsorbent:

☐ Activated Charcoal Type:

☐ Other (specify):

6. Number of Beds:

7. Dimensions of Bed

Bed No.1

Thickness in direction of gas flow(inches): Cross-section area (sq. inches):

Bed No.2

Thickness in direction of gas flow(inches): Cross-section area (sq. inches):

Bed No.3

Thickness in direction of gas flow(inches): Cross-section area (sq. inches):

8. Inlet Gas Temperature: °F or °C

9. Design Pressure Drop Across Unit: inches H_2O

10. Type of Regeneration

☐ Replacement ☐ Steam ☐ Other (specify):

11. Method of Regeneration

☐ Alternate use of beds ☐ Source shut down ☐ Other (specify):

Describe procedures used to ensure that emissions from regeneration process are treated or minimized:

12. Maximum Operation Time Before Regeneration:

13. Is adsorber equipped with a break-through detector? ☐ Yes ☐ No

14. a) Control Efficiency(s) of Adsorber (%):

b) Collection Efficiency(s) of Adsorber (%):

15. Pollutant(s) Controlled:

Afterburner (Incinerator for Air Pollution Control)

1a. Designated Reference Number of Afterburner: **E-401 Oxidizer**

1b. Designated Reference Number of Unit which uses Afterburner: **ST-7 thru 10, PAR7-10**

2. Manufacturer: **LESNI A/S**

3. Model Name & Serial Number: **CAP 12000 with Ethylene Oxide Balancer which is described below as "*Other Type of Control Equipment*"**

4. Construction Date: **09/07/2012**

5. Type of Afterburner: ☐ Thermal ☒ Catalytic ☐ Other (specify):

6. Combustion Chamber Dimensions

   Length (inches): **Skid = 30 ft** Cross-section area (sq. inches): **Skid 12 x 20 ft**

7. Inlet Gas Temperature: °F or **115 °C at Burner Inlet**

8. Operating Temperature of Chamber: °F *or* **145 °C at Catalyst Inlet**

9. Type of Auxiliary Fuel: **Natural Gas** Higher Heating Value: **1028 Btu/scf**

10. a)% Sulfur: **NA** b)% Ash: **NA** c)% Nitrogen: **NA**

11. Maximum Auxiliary Fuel Usage (specify units): a) Hourly: **NA**

    b) Annually: **NA**

12. Number of Burners Per Afterburner: **1**

    Burner No. 1 @: **1.365 MM** BTU per hour **(400 kw)**

    Burner No. 2 @: BTU per hour

    Burner No. 3 @: BTU per hour

13. Catalyst Used: ☒ Yes ☐ No

    Type of Catalyst: **Metal Oxide Low Temperature Catalyst**

14. Catalyst Sampling Interval: **Once per year**

15. Heat Exchanger Used: ☒ Yes ☐ No

    Type of Heat Exchanger: **Recuperative Shell & Tube**

    Heat Recovery: **65-70%**

16. Gas Flow Rate (scfm): **7,100**

17. Combustion Chamber Design Residence Time (seconds): **0.5**

18. Moisture Content of Exhaust Gas (%): **variable**

19. a) Control Efficiency of Afterburner (%): **99.9% or 1 PPM (combined control of balancer and oxidizer)**

    b) Collection Efficiency of Afterburner (%): **100%**

20. Pollutant(s) Controlled: **Ethylene Oxide**

Condenser

1a. Designated Reference Number of Condenser Unit:

1b. Designated Reference Number of Unit which uses Condenser:

2. Manufacturer:

3. Model Name & Number:

4. Construction Date: / /

5. Heat Exchange Area (sq. ft.):

6. Coolant Flow Rate: ☐ Water: gpm ☐ Air: scfm (at 68° F)

☐ Other (specify) : Type: Flow Rate:

7. Gas Flow Rate: scfm (at 68° F)

8. Coolant Temperature (°F): In: Out:

9. Gas Temperature (°F): In: Out:

10. a) Control Efficiency(s) of Condenser:

b) Collection Efficiency(s) of Condenser (%):

11. Pollutant(s) Controlled:

Electrostatic Precipitator

1a. Designated Reference Number of Electrostatic Precipitator:

1b. Designated Reference Number of Unit which uses Electrostatic Precipitator:

2. Manufacturer:

3. Model Name & Serial Number:

4. Construction Date: / /

5. Collecting Electrode Area (sq ft):

6. Gas Flow Rate (scfm):

7. Voltage Across the Precipitator Plates (kv):

8. Resistivity of Pollutants (ohms):

9. Number of Fields in the Precipitator:

10. Grain Loading (grains/scf @ 68° F): a) Inlet: b) Outlet:

11. a) Control Efficiency(s) of Electrostatic Precipitator (%):

b) Collection Efficiency(s) of Electrostatic Precipitator (%):

12. Pollutant(s) Controlled:

Filter

1a. Designated Reference Number of Filter:
1b. Designated Reference Number of Unit which uses Filter:
2. Manufacturer:
3. Model Name & Serial Number:
4. Construction Date: / /
5. Filtering Material:
6. Air to Cloth Ratio (sq ft):
7. Cleaning Method: ☐ Shaker ☐ Reverse Air ☐ Pulse Air
☐ Pulse Jet ☐ Other (specify):
8. Gas Cooling Method: ☐ Ductwork Length (ft): Diameter (inches):
☐ Heat Exchanger ☐ Bleed-in Air ☐ Water Spray ☐ Other (specify):
9. Gas Flow Rate (from source): scfm (at 68□ F)
10. Cooling Gas Flow Rate
Bleed-in Air: scfm (at 68□ F) Water Spray: gpm
11. Inlet Gas Condition Temperature (□F): Dew Point (□F):
12. Grain Loading (grains/scf @ 68° F): a) Inlet: b) Outlet:
13. Design Pressure Drop Across Unit (inches H_2O):
14. a) Control Efficiency of Filter (%):
b) Collection Efficiency of Filter (%):
15. Pollutant(s) Controlled:

Cyclone

1a. Designated Reference Number of Cyclone:
1b. Designated Reference Number of Unit which uses Cyclone:
2. Manufacturer:
3. Model Name & Serial Number:
4. Construction Date: / /
5. Type of Cyclone: ☐ Single ☐ Multiple
6. Number of Cyclones in Multiple Cyclone:
7. Gas Flow Rate: scfm (at 68° F)
8. Grain Loading (grains/SCF @ 68° F): a) Inlet: b) Outlet:
9. Design Pressure Drop Across Unit (inches H_2O):
10. a) Control Efficiency of Cyclone (%):
b) Collection Efficiency of Cyclone (%):
11. Pollutant(s) Controlled:

Scrubber

1a. Designated Reference Number of Scrubber:

1b. Designated Reference Number of Unit which uses Scrubber:

2. Manufacturer:

3. Model Name & Serial Number:

4. Construction Date: / /

5. Type of Scrubber: ☐ Venturi ☐ Wet Fan

☐ Packed: Packing Material:

Size: Packed Height (inches):

☐ Spray: Number of Nozzles:

Nozzle No. 1 Pressure (psig):

Nozzle No. 2 Pressure (psig):

Nozzle No. 3 Pressure (psig):

Nozzle No. 4 Pressure (psig):

☐ Other (specify): ***(Attach description and sketch with dimensions)***

6. Design Pressure Drop Across the Scrubber (inches H_2O):

7. Type of Flow: ☐ Concurrent ☐ Countercurrent ☐ Crossflow

8. Scrubber Geometry

Length in direction of Gas Flow (ft): Cross Sectional Area (sq ft):

9. Chemical Composition of Scrubbing Liquid:

10. a. Scrubbing Liquid Flow Rate (gpm):

b. Fresh Liquid Make-Up Rate (gpm):

11. Scrubber Liquid: ☐ One Pass ☐ Recirculated

12. Gas Flow Rate: scfm (at 68□ F)

13. Inlet Gas Temperature (°F):

14. a) Control Efficiency(s) of Scrubber (%):

b) Collection Efficiency(s) of Scrubber (%):

15. Pollutant(s) Controlled:

Mist Eliminator

1a. Designated Reference Number of Mist Eliminator:
1b. Designated Reference Number of Unit which uses Mist Eliminator:
2. Manufacturer:
3. Model Name & Number:
4. Construction Date: / /
5. Face Velocity (feet per second):
☐ Vertical Flow ☐ Horizontal Flow ☐ Diagonal
6. Design Pressure Drop Across Mist Eliminator (inches H_2O):
7. a) Control Efficiency of Mist Eliminator at:
1 mm Hg: 5 mm Hg: 10 mm Hg:
b) Collection Efficiency of Mist Eliminator (%):
8. Pollutant(s) Controlled:

Other Type of Control Equipment for Degreasing Equipment

1a. Designated Reference Number of Equipment:
1b. Designated Reference Number of Unit which uses Equipment:
2. Manufacturer:
3. Model Name & Serial Number:
4. Construction Date: / /
5. Method of Controls
☐ Refrigerator Chiller ☐ Water Spray ☐ Other (specify):
6. a) Control Efficiency of Other Type of Control Equipment (%):
b) Collection Efficiency of Other Type of Control Equipment (%):
7. Pollutant(s) Controlled:

Other Type of Control Equipment

1a. Designated reference number of other type of control equipment: **E-401 Balancer**
1b. Designated reference number of unit which uses other type of control equipment: **ST-7 thru 10, PAR 7-10**
2. Manufacturer: **LESNI A/S**
3. Model Name & Serial Number: **LKV 800**
4. Construction Date: **9/7/2012**
5. Generic name of other equipment: **Ethylene Oxide Balancer**
6. a) Control efficiency of other type of control equipment (%): **variable, combined control of balancer and oxidizer is 99.9% or 1 PPM**
b) Collection efficiency of other type of control equipment (%):**100%**
7. Pollutant(s) Controlled: **Ethylene Oxide**

Attachment E-3 Supplemental Application Form
Stack Parameters

Applicant Name: **United States Surgical, Division of Tyco Healthcare Group LP**
(As indicated on *Permit Application Transmittal Form)*

DEP USE ONLY
App. No.:
EPE No.:

Section I. Stack Parameters (Make additional copies, if necessary)

Stack No. (1)	Unit No.(s) (2)	Control Equipment No.(s) (3)	Height ft. (4)	Diameter ft. (5)	Temp °F (6)	Flow ACFM (7)	Exit Dir. H or V (8)	Rain Hat Y or N (9)	Stack Lining (10)	Distance to Property Line ft. (11)
E-401	ST-7, PAR7 ST-8, PAR8 ST-9, PAR9 ST-10, PAR10	E-401	58	2.33	176	8,552	V	N	Stainless Steel	247
E-500	POLSAR SUTSAR	NA	58	3.00	100	12,462	V	N	Galvanized Steel	248

Attachment G: BACT/LAER Determination Form

(Complete for each pollutant for which BACT/LAER must be incorporated. Duplicate this section as necessary.)

Applicant Name: **United States Surgical, Division of Tyco Healthcare Group LP**
(As indicated on the *Permit Application Transmittal Form)*

Unit Numbers: **ST-7, ST-8, ST-9, ST-10, PAR-7, PAR-8, PAR-9, PAR-10**

Unit Description: **Four Ethylene Oxide Sterilizers & Four Primary Aeration Rooms**

Pollutant: **Ethylene Oxide**

DEP USE ONLY
App. No.: _____

Section I: Identify LAER

To ensure a sufficiently broad and comprehensive search of control alternatives, sources other than the RBLC database should be investigated and documented. These sources include: EPA/State air quality permits, control equipment vendors, trade associations, international agencies or companies, technical papers or journals. Attach documentation of investigation to this form. The source of information, e.g., RBLC, South Coast AQMD, state permit, vendor, etc. and sufficient information for verification of the achievable limit, e.g. contact information to include: name, affiliation, address, phone, email of contact; any relevant permit; RBLC ID; etc. should be included for each system.

When using the RLBC database: The RACT/BACT/LAER Clearinghouse (RBLC) database on EPA's Technology Transfer Network (TTN), Clean Air Technology Center (CATC) website may be accessed at: (http://cfpub.epa.gov/rblc/cfm/basicsearch.cfm). Select the "Find Lowest Emissions Rate" search option. Choose the process type and pollutant from the dynamic menu, then "run report now". The results will be sorted by the emission limit from lowest to highest. You may print this list and attach to this form.

A. List all available control systems with a practical potential for application to this type of unit.
   1. **Catalytic Oxidizer with Balancer**
   2. **Catalytic Oxidizer**
   3. **Packed Scrubber**
   4.
   5.

B. List control systems included above that are rejected as technically infeasible for this unit. Include an explanation for each rejection.
   1.
   2.
   3.
   4.
   5.

Section I: Identify LAER (continued)

C. Determine overall control effectiveness of remaining control systems:

	System 1	System 2	System 3	System 4	System 5
Description of Control System	Catalytic Oxidizer with Balancer	Catalytic Oxidizer	Packed Scrubber		
1. Inlet Concentration	33.33 lb/hr	33.33 lb/hr	33.33 lb/hr		
2. Outlet Concentration	0.0587 lb/hr	0.3333 lb/hr	0.3333 lb/hr		
3. Collection Efficiency	100%	100%	100%		
4. Removal Efficiency	99.9% or 1 PPM	99.0%	99.0%		
5. Overall Control Efficiency	99.8%	99.0%	99.0%		
6. Emission Estimates	0.0587 lb/hr	0.3333 lb/hr	0.3333 lb/hr		
7. Source of Emission Estimates	Mfg Guarantee	NJ SOTA	NJ SOTA		

D. Identification of LAER:

Catalytic Oxidizer with Balancer represents LAER, which is selected as BACT for this application.

Section II: Top-Down BACT Analysis

A. Rank the control systems in *decreasing order* of overall control effectiveness. The system identified as LAER in Section I should rank number 1.

1. **Section II of this form is not required since LAER has been selected as BACT.**
2.
3.
4.
5.

B. Complete the cost analysis for each control system:

	System 1	System 2	System 3	System 4	System 5
1. Type of System					
2. Installed Capital Cost (ICC)					
3. Annual Labor Cost					
4. Annual Maintenance Cost					
5. Annual Energy Cost					
6. Replacement Parts and Materials Cost					
7. Waste Treatment and Disposal Cost					
8. Miscellaneous Annual Costs					
9. **Total Direct Annual Cost** (add Items 3 to 8)					
10. Annual Overhead Cost					
11 Administrative, Tax and Insurance Costs					
12. Capital Recovery Cost					

(Continued on next page)

Section II: Top-Down BACT Analysis (continued)

	System 1	System 2	System 3	System 4	System 5
13. Tax Credits					
14. **Total Indirect Annual Cost** (add Items 10 to 12 and subtract item 13)					
15. Total Annual Cost for the Control System (add Items 9 and 14)					
16. Total Pollutant Collected					
17. Unit Control Cost (item 15 ÷ 16) (dollars per ton)					

C. Proposed BACT:

D. Reason or Justification for Proposed BACT:

Connecticut Department of

ENERGY &
ENVIRONMENTAL
PROTECTION

BUREAU OF AIR MANAGEMENT
NEW SOURCE REVIEW PERMIT
TO CONSTRUCT AND OPERATE A STATIONARY SOURCE

Issued pursuant to Title 22a of the Connecticut General Statutes (CGS) and Section 22a-174-3a of the Regulations of Connecticut State Agencies (RCSA).

Owner/Operator:	United States Surgical, Division of Tyco Healthcare Group LP
Address:	195 McDermott Road, North Haven, CT 06473
Equipment Location:	195 McDermott Road, North Haven, CT 06473
Equipment Description:	Ethylene Oxide Sterilizer #ST-7
Collateral Conditions:	This permit contains collateral conditions for four Ethylene Oxide Sterilizers.

Town-Permit Numbers:	135-0143
Town-Premises Numbers:	135-68
Permit Issue Date:	NOV 0 8 2011
Expiration Date:	

This permit is attached as an example. Permits 135-0144, 135-0145 and 135-0146 should be revised in a similar manner.

Macky McCleary
Deputy Commissioner

11/8/11
Date

79 Elm Street, Hartford, CT 06106-5127
www.ct.gov/deep

PERMIT FOR PROCESS EQUIPMENT

DEPARTMENT OF ENERGY AND ENVIRONMENTAL PROTECTION
BUREAU OF AIR MANAGEMENT

This permit specifies necessary terms and conditions for the operation of this equipment to comply with state and federal air quality standards. The Permittee shall at all times comply with the terms and conditions stated herein.

PART I. DESIGN SPECIFICATIONS

A. General Description

United States Surgical, Division of Tyco Healthcare Group LP operates four sterilization systems. The units are used to sterilize medical devices. The devices are introduced to the sterilization units and sterilized using a mixture of ethylene oxide, nitrogen and steam. The sterilized product is then off-gassed; first in a primary aeration room and then a secondary aeration room. All ~~process related~~ exhausts and vents are ducted to a single stack equipped with a balancer and oxidizer. This permit covers sterilizer #ST-7. Sterilizers' #ST-8, #ST-9 and #ST-10 are covered by permit nos. 135-0144, 135-0145 and 135-0146 respectively. There are conditions throughout this permit that apply to all four sterilizers combined. Any such condition is so specified.

sterilizer and primary aeration room

B. Equipment Design Specifications

Equipment: Ethylene Oxide Sterilization Chamber and associated Primary and Secondary Aeration Rooms

C. Control Equipment Design Specifications

1. Equipment: Catalytic Oxidizer
   Make: LESNI A/S
   Model Name: CAP 12000
   Catalyst Type: Low Temperature Metal Oxide Catalyst

2. Equipment: Balancer
   Make: LESNI A/S
   Model Name: CAP LKV 800

Minimum Ethylene Oxide Control Efficiency: 99.9% or a maximum concentration of 1.0 ppm in outlet gas; whichever is less stringent.

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BUREAU OF AIR MANAGEMENT

PART I. DESIGN SPECIFICATIONS, continued

Stack No: E-500
Minimum gas flowrate: (acfm): 5,000
Minimum distance to property line (ft): 248
Minimum stack height (ft): 58
Equipment connected: Secondary aeration rooms

D. Stack Parameters

insert info for additional stack

Stack No.: E-401
Minimum gas flowrate (acfm): 4,000
Minimum distance to property line (ft): ~~245~~ 247
Minimum stack height (ft): ~~40~~ 58
Other equipment connected to this stack: Sterilizer #ST-8, #ST-9 and #ST-10

including each sterilizers primary aeration room

PART II. OPERATING REQUIREMENTS

A. Equipment

1. Allowable Sterilant: Ethylene Oxide

3. Maximum Allowable Sterilant Consumption: 50 lb/batch

4. Maximum Number of Batches: 4 batches/day; 1460 batches/yr

5. Maximum Annual Sterilant Consumption for Sterilizer #ST-7, #ST-8, #ST-9 and #ST-10 combined: 146 tons/consecutive twelve (12) month period

B. Controls

Catalytic Oxidizer

Type of Auxiliary fuel: Natural Gas
Maximum Annual Usage: 11.63 MMcf
Maximum heat input: 1.365 MMBtu/hr
Catalyst type: Low Temperature Metal Oxide Catalyst

PART III. MONITORING, RECORD KEEPING AND REPORTING REQUIREMENTS

A. The Permittee shall make and maintain records of the amount of ethylene oxide used monthly and during each twelve consecutive months. The consecutive twelve month usage shall be calculated by adding the current month's usage to that of the previous eleven months.

B. The Permittee shall maintain records of the dates when the oxidizer catalyst is changed.

C. The Permittee shall measure and record once per hour the ethylene oxide concentration at the outlet to the atmosphere or

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BUREAU OF AIR MANAGEMENT

PART III. MONITORING, RECORD KEEPING AND REPORTING REQUIREMENTS, cont

continuously monitor and record the oxidation temperature at the outlet to the catalyst bed.

D. The Permittee shall comply with one of the work practices outlined in 40 CFR 63.363(b)(4).

E. Records demonstrating compliance with this permit shall be kept on site, for a period no less than the past five calendar years, and be made available upon request to the Bureau of Air Management.

PART IV. OPERATION AND MAINTENANCE REQUIREMENTS

A. The Permittee shall operate and maintain this equipment in accordance with the manufacturer's specifications and written recommendations.

B. The Permittee shall properly operate the control equipment at all times that this equipment is in operation and emitting air pollutants.

PART V. ALLOWABLE EMISSION LIMITS

The Permittee shall not cause or allow this equipment to exceed the emission limits stated herein at any time.

The following emission limits are for Sterilizers' #ST-7, #ST-8, #ST-9 and #ST-10 combined ← including the primary and secondary aeration rooms

A. Criteria Pollutants

Equipment	Pollutant	lb/hr	ppmv	tpy
Sterilization Process	VOC(Ethylene Oxide)	0.144 ~~0.049~~	1.0	0.631 ~~0.214~~
Catalytic Oxidizer (Natural Gas Combustion)	PM-10/PM 2.5	0.010		
	SOx	0.001		
	NOx	0.133		
	VOC	0.007		
	CO	0.112		
	Pb	0.000		

FIRM NAME: United States Surgical, Division of Tyco Healthcare Group LP
EQUIPMENT LOCATION: 195 McDermott Road, North Haven, CT 06473
EQUIPMENT DESCRIPTION: Ethylene Oxide Sterilizer #ST-7

Town No: 135 Premises No: 68 Permit No: 0143 Stack No: 17

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PART V. ALLOWABLE EMISSION LIMITS, continued

TOTAL EMISSIONS	Pollutant	tpy	
	PM-10/PM 2.5	0.044	
	SOx	0.003	
	NOx	0.582	
	VOC (includes Ethylene Oxide)	~~0.246~~	0.663
	CO	0.488	
	Pb	0.000	

Demonstration of compliance with the above emission limits shall be met by calculating the emission rates using emission factors from the following sources:

i. Natural Gas Combustion: emission factors from AP-42, 5th edition Table 1.4-1 and 1.4-2;
ii. Ethylene Oxide: concentration monitoring in accordance with 40 CFR §63.364, material balance and performance test results.

The commissioner may require other means (e.g. stack testing) to demonstrate compliance with the above emission limits, as allowed by state or federal statute, law or regulation.

B. Hazardous Air Pollutants (HAPs) - (State Only Requirement)

The Permittee shall ensure that the HAPs actual stack concentration (ASC) does not exceed the maximum allowable stack concentration (MASC) using the equation in RCSA §22a-174-29(c). The Permittee shall be allowed to use the adjustment factor in RCSA §22a-174-29(i).

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PART VI. STACK EMISSION TEST REQUIREMENTS (Applicable if -X- Checked)

Testing shall be performed in accordance with the latest Emission Test Guidelines available on the DEEP website: *http://www.ct.gov/dep/cwp/view.asp?a=2684&q=322076&depNav_GID=1619* as well as, the requirements outlined in 40 CFR 63.365.

Initial stack/performance testing shall be required for the following:

☐ PM ☐ SOx ☐ NOx ☐ CO ☐ VOC ☐ Pb
☒ Other: Ethylene Oxide

A. The Permittee shall conduct an initial compliance performance test as specified in 40 CFR 63.363 no later than 180 days from the date of initial start-up of the sterilizer chamber.

B. The Permittee shall complete and submit an Intent to Test (ITT) form and complete test package no later than 60 days prior to the schedule test date. The performance test shall be designed to show compliance with the lb/hr and ppm emission limits in PART V and the overall control efficiency in PART I of this permit.

C. The emission test report shall be submitted no later than 60 days after the completion of the performance test.

D. All methods and procedures listed in the ITT shall be consistent with the requirements of RCSA Section 22a-174-5 and 40 CFR 63.365.

E. The Permittee shall conduct recurrent emission testing for ethylene oxide within five years from the date of the previous stack test to demonstrate compliance with the lb/hr and ppm limits, as well as the overall control efficiency. Emission testing, as specified in 40 CFR 63.363(b)(4)(i), used to comply with the work practices requirement, may be used to fulfill the emission testing requirement in PART VI of this permit.

PART VII. SPECIAL REQUIREMENTS

A. STATE ONLY REQUIREMENT: The Permittee shall not cause or permit the emission of any substance or combination of substances which creates or contributes to an odor beyond the property boundary of the premises that constitutes a nuisance as set forth in RCSA Section 22a-174-23.

B. STATE ONLY REQUIREMENT: The Permittee shall operate this source and all accompanying equipment at all times in a manner so as not

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to violate or significantly contribute to the violation of any applicable state noise control regulations, as set forth in RCSA Sections 22a-69-1 through 22a-69-7.4.

PART VIII. ADDITIONAL TERMS AND CONDITIONS

A. This permit does not relieve the Permittee of the responsibility to conduct, maintain and operate the regulated activity in compliance with all applicable requirements of any federal, municipal or other state agency. Nothing in this permit shall relieve the Permittee of other obligations under applicable federal, state and local law.

B. Any representative of the DEEP may enter the Permittee's site in accordance with constitutional limitations at all reasonable times without prior notice, for the purposes of inspecting, monitoring and enforcing the terms and conditions of this permit and applicable state law.

C. This permit may be revoked, suspended, modified or transferred in accordance with applicable law.

D. This permit is subject to and in no way derogates from any present or future property rights or other rights or powers of the State of Connecticut and conveys no property rights in real estate or material, nor any exclusive privileges, and is further subject to any and all public and private rights and to any federal, state or local laws or regulations pertinent to the facility or regulated activity affected thereby. This permit shall neither create nor affect any rights of persons of municipalities who are not parties to this permit.

E. Any document, including any notice, which is required to be submitted to the commissioner under this permit shall be signed by a duly authorized representative of the Permittee and by the person who is responsible for actually preparing such document, each of whom shall certify in writing as follows: "I have personally examined and am familiar with the information submitted in this document and all attachments thereto, and I certify that based on reasonable investigation, including my inquiry of those individuals responsible for obtaining the information, the submitted information is true, accurate and complete to the best of my knowledge and belief. I understand that any false statement made in the submitted information may be punishable as a criminal offense under Section 22a-175 of the Connecticut General Statutes, under Section 53a-157b of the Connecticut General Statutes, and in accordance with any applicable statute."

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BUREAU OF AIR MANAGEMENT

F. Nothing in this permit shall affect the commissioner's authority to institute any proceeding or take any other action to prevent or abate violations of law, prevent or abate pollution, recover costs and natural resource damages, and to impose penalties for violations of law, including but not limited to violations of this or any other permit issued to the Permittee by the commissioner.

G. Within 15 days of the date the Permittee becomes aware of a change in any information submitted to the commissioner under this permit, or that any such information was inaccurate or misleading or that any relevant information was omitted, the Permittee shall submit the correct or omitted information to the commissioner.

H. The date of submission to the commissioner of any document required by this permit shall be the date such document is received by the commissioner. The date of any notice by the commissioner under this permit, including but not limited to notice of approval or disapproval of any document or other action, shall be the date such notice is personally delivered or the date three days after it is mailed by the commissioner, whichever is earlier. Except as otherwise specified in this permit, the word "day" means calendar day. Any document or action which is required by this permit to be submitted or performed by a date which falls on a Saturday, Sunday or legal holiday shall be submitted or performed by the next business day thereafter.

I. Any document required to be submitted to the commissioner under this permit shall, unless otherwise specified in writing by the commissioner, be directed to: Office of Director; Engineering & Enforcement Division; Bureau of Air Management; Department of Energy and Environmental Protection; 79 Elm Street, 5th Floor; Hartford, Connecticut 06106-5127.

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